LETTER TO THE EDITOR

ADMIRATION FOR THE WICHITA IN-SCHOOL XYLITOL PROJECT

Dorothy L Gray’s guest editorial on The Wichita Xylitol Project shows that unselfish volunteerism has not vanished in the United States [Fluoride 45(4):323-328; October-December 2012]. As the author of several clinical trials and laboratory experiments in the fields of nutrition, preventive dentistry, and public health, I can only admire the long-term and tenacious efforts of the authors, benefactors, and the parents on behalf of this Wichita school program. To maintain the interest of all the participants, including the children of Stanley Elementary School children, over such a long period of time serves as an example to other communities where the dental health of young subjects requires extra attention.

These types of demonstration programs carried out under real-life conditions are extremely welcome in the current situation where the scientific community (including myself) almost laconically demands that usable and valid data can only be generated through evidence-based medical trials involving placebo-controlled, multi-center, multiple-cell, cross-over, and other sophisticated features. The meta-analyses so far carried out have been too strict by excluding most in-school programs.

The Wichita project shows that this type of xylitol chewing gum and mint program can have remarkable utility value. This project was also important also because the quoted municipal water fluorine level (0.37 ppm) in Wichita is clearly suboptimal and cannot be considered high enough for effective natural caries prevention. By chance, the Wichita project coincided with another family-centered program conducted on infants at a Finnish Public Health Center during 2002–2011.1 Both projects underline the importance of early caries prevention. Individuals and societies can spare considerable amounts of money by imposing early in-family caries prevention that ideally starts with expectant mothers.

In Finland, the Public Health Center policy recommends the use of both xylitol and fluorine in caries prevention. Some manufacturers are marketing chewing gums, troches, dentifrices, mouthwashes, and other dental health adjuvants that contain various xylitol-fluorine combinations, which are normally used topically either by a dentist or the consumer (depending on the amount of fluorine present; higher fluorine concentrations may presume professional use). Several fluorine-xylitol-based prophylactic pastes for professional use are available in various countries. Dental floss that contains both fluorine and xylitol may represent technologically extreme modes of application.

Against this background, it is important to recall that some studies have suggested the possibility of synergism between xylitol and fluoride in their effects on mutans streptococci (a collective term for caries-inducing Streptococcus species).2 For example, xylitol was found to augment the metabolic effects on Streptococcus mutans at low levels of fluoride.3 A mathematical model has been published to describe, optimize, and predict synergistic interaction between fluoride and xylitol on acid production by mutans streptococci.4 These findings are in congruence with an earlier observation suggesting that the cells of S. mutans
possess at least two glucose transport systems, one of which is relatively fluoride-insensitive. Consequently, combinations of fluoride and xylitol may display quite complex effects on mutans streptococci.

A recent paper suggested that the inclusion of 10% xylitol increased the effects of a fluoridated dentifrice against enamel erosion plus abrasion in vitro. Although in situ clinical studies need to be carried out to confirm these data, it is possible that significant caries prevention and possibly other positive oral health effects can be achieved using fluorine-xylitol combinations.

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REFERENCES